

Appl. No. 09/530,803

REMARKS

Claim 16 has been canceled.

Claim 1 has been amended to indicate that the polymer nucleated with the polymerized vinyl compound is the main component of the coloured polymer composition. Support for this amendment can be found in the Specification on page 5, line 11-13.

Claim 10 has been amended to more clearly set forth the steps comprising the claimed method. Support for these amendments can be found in the Specification on page 5, lines 11-13 and lines 19-23, page 13, lines 10-11, and Example 3.

No new matter has been added.

Claim Objections

The Examiner has objected to claim 16 as being a substantial duplicate of claim 1. Applicants have canceled claim 16, thereby overcoming the objection.

Rejections Under 35 U.S.C. § 103

The Examiner has rejected claims 1-5 and 7-15 as unpatentable over U.S. Patent No. 4,551,501 (Shiga et al.) in view U.S. Patent No. 4,670,491 (Stretanski et al.) and/or U.S. Patent No. 4,192,794 (Wang et al.).

The Examiner contends that Shiga et al. disclose a polymer composition comprising a blend of crystalline polypropylene and 0.05-10,000 ppm by weight of a vinyl cycloalkane (claim 1). The Examiner further alleges that treatment of a Ti/Et₃Al catalyst with vinyl cyclohexane for 15 minutes results in the formation of poly(vinyl cyclohexane) containing

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the active catalyst. He notes that in a subsequent step, polypropylene is polymerized in the presence of the catalyst modified with a polymer containing vinyl units, previously prepared. The Examiner therefore concludes that the method recited in claim 1 is taught in the prior art. The Examiner acknowledges that while the inventors contemplate the use of pigments, no specific amount of pigment is disclosed.

According to the Examiner, the skilled artisan would turn to Stretanski et al. who teach propylene compositions containing 2.5 wt % titanium oxide as pigment or Wang et al. which reveal polypropylene resin pigmented with 5 wt % TiO_2 . The Examiner alleges that since none of the references indicate that these amounts have detrimental effects on the polyolefin product, one having skilled in the art would reasonably expect success from such a combination. Applicants respectfully traverse.

Example 1 (1) of the Shiga reference discloses a propylene-vinyl cyclohexane polymerization catalyst used to make a copolymer of polypropylene and VCH, which is used as a "master batch" of the VCH additive. Example 1 (2) uses this "additive" in an amount of only 0.5 parts by weight together with other additives to a 100 part by weight of the "base resin". The base resin is a propylene homopolymer in this particular example. Thus, in Shiga the nucleated polypropylene polymer is used in small amounts as a nucleating agent additive. This nucleated polypropylene polymer is then blended mechanically with the (non-nucleated) base resin by melting and mixing the components. As a result, the nucleated polypropylene polymer is distributed/mixed as a "nucleating agent additive" within the base resin. It is known in the art, however, that mechanical mixing is problematic for obtaining a mixed product with sufficient homogeneity.

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Furthermore, the nucleation of the base resin then occurs during the cooling period of the melted polymer product.

In contrast to the method used by Shiga, in the present invention the polymerized vinyl compound nucleated polypropylene polymer is not used in any additive amounts, or as a master batch, but forms the base resin. That is, the polymer component of the colored polymer composition is the main component. The present invention does not use the polymerized VCH nucleated polypropylene as a nucleating agent and no mechanical blending of said nucleated polypropylene polymer is effected. Instead, the nucleating agent which is the catalyst modified with the polymerized VCH as the nucleating agent, is added during the polypropylene polymerization step. As a result, the distribution/mixing of the nucleating agent which originates from the modified catalyst is effected *in situ* during the polypropylene polymer polymerization step.

Because of the difference in the distribution/mixing, a nucleated polypropylene polymer with excellent homogeneity with respect to the nucleating agent is obtained. That is, in the present invention the incorporation of the polymerized vinyl compound to the base polymer during the polymerization process itself results in a very uniform distribution of the nucleating agent and causes uniform crystallization during the nucleation step. This contributes to the controlled shrinkage, which is highly beneficial in molding applications such as for caps and closures.

To summarize, Shiga uses mechanical blending instead of the *in situ* blending of the nucleating agent used in the instant application. As a consequence, it is not at all evident or even likely that the final polymer product of Shiga and the product of the present

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invention are similar when the homogeneity of the product in respect to the nucleating agent is considered. Specifically, in the nucleated product of Shiga, the nucleating agent is distributed differently (mechanically). Thus, it is not evident that the product obtained from the Shiga reference inherently has the same homogeneity with respect to nucleating agent or that it results in the same homogenous nucleation, which contributes to the desirable low shrinkage properties found in the claimed nucleated polypropylene polymer. As a consequence, Applicants urge that the present invention is, indeed, non-obvious over Shiga either alone or in combination with Stretanski et al. and/or Wang et al.

In view of the above, Applicants respectfully request reconsideration and removal of the rejection.

In view of the above remarks, all of the claims remaining in the case are submitted as defining non-obvious patentable subject matter.

The Examiner is respectfully requested to enter this reply after final in that it raises no new issues. Alternatively, the Examiner is respectfully requested to enter this reply after final in that it places the application in better form for appeal.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136 (a), the Applicants respectfully petition for a Three (3) Month Extension of Time for filing a response in connection with the present application and the required fee of \$1020.00 is being submitted concurrently with the Notice of Appeal.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Leonard R. Svensson

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(Reg. No. 30,330) at the telephone number of the undersigned below, to conduct an Interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment and credit any overpayment to Deposit Account 02-2448 for any additional fees requesting under 37 CFR §§ 1.16 or 1.17; particularly, Extension of Time fees.

Respectfully submitted,

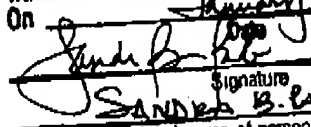
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